

CLAIMS

1. Method for diagnosing and/or solving, in particular remotely, a technical problem likely to arise before, during or after the operation of a heat treatment process, comprising the steps of:
 - (a) indication and/or selection by the user of a type of heat treatment process implemented or to be implemented;
 - (b) indication and/or selection by the user of at least one type of technical problem to be solved arising or likely to arise during implementation of the type of heat treatment process of step (a);
 - (c) indication and/or selection by the user of at least one parameter, preferably several parameters, relating to the configuration of the said heat treatment process of step (a);
 - (d) processing of at least some of the indications or selections made by the user in steps (a), (b) and (c);
 - (e) proposal to the user of at least some information relating to at least one modification or at least one adjustment to be made to at least one configuration parameter of the said heat treatment process so as to solve, at least partly, the type of technical problem of step (b).
2. Method for determining, setting, adjusting and/or modifying at least one parameter of a heat treatment process, before or during implementation of the said heat treatment process by a user, comprising the steps of:
 - (a') indication and/or selection by the user of a type of heat treatment process implemented or to be implemented;
 - (b') indication and/or selection by the user of at least one parameter relating to the configuration of the said heat treatment process, that has to be or is likely to be adjusted, modified or set,

before or during implementation of the heat treatment process of step (a');;

(c') processing of at least some of the indications or selections made by the user in steps (a') and (b');;

(d') proposal to the user of at least some information relating to at least one modification or at least one setting to be made of at least the said configuration parameter of the said heat treatment process.

3. Method according to either of Claims 1 and 2, characterized in that it includes at least one additional step:
- (f) of displaying, storing, printing, transmitting, interpreting and/or exporting at least some information obtained in step (e) or in step (d'); and/or
- (g) of modifying or setting at least one configuration parameter, preferably several configuration parameters, of the said heat treatment process according to at least some information obtained in step (e) or in step (d').
4. Method according to one of Claims 1 to 3, characterized in that in step (a) or (a'), the type of heat treatment process implemented or to be implemented is chosen or selected from the group formed by cutting processes, welding processes, marking processes, heat spraying processes and combinations thereof.
5. Method according to one of Claims 1 to 4, characterized in that in steps (a), (b) and/or (c) or (a') and/or (b'), the indication or the selection is made by the user via data or information acquisition and/or selection means.

6. Method according to one of Claims 1 to 5, characterized in that, in step (f), the display is made on a touchscreen.
- 5 7. Method according to one of Claims 1 to 6, characterized in that, in step (b) or in step (b'), the type of technical problem to be solved is a problem relating to:
- 10 - the choice of the consumables, the parameters of the process, the setting of a piece of equipment or of a fitting;
- health or safety;
- malfunction of a piece of equipment or a fitting;
- 15 - the productivity of the process;
- the quality of the work produced.
8. Method according to one of Claims 1 to 7, characterized in that in step (c) or in step (b'), at least one configuration parameter of the said heat treatment process is chosen from the voltage, the current, the feed rate of the filler wire, the speed of advance or welding speed, the nature of the filler wire or electrode, the nature of the shielding gas, its flow rate and/or its quality,
- 20 the choice of solid flux associated with the wire in submerged-arc welding, the orientation and position of the welding torch with respect to the weld to be produced, the preparation and the thickness of the workpieces to be joined together
- 25 or, in the case of cutting, the cutting speed and/or the gas used.
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9. Method according to one of Claims 1 to 8, characterized in that in step (d) or in step (c'), the processing of the indications or selections made by the user comprises:
- 35 (i) a comparison of the said indications or selections with reference information

stored in at least one database or databank,

(ii) a proposal of at least one solution, of an explanation and/or of an answer to a question raised, the said solution, explanation and/or answer being stored in at least one database or databank.

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10. Method according to one of Claims 1 to 9, characterized in that a module for the automatic acquisition of the welding parameters and for the transmission of the said welding parameters to a display screen is incorporated, allowing at least one of the said welding parameters to be displayed.

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11. System for diagnosing and/or solving, in particular remotely, a technical problem likely to arise before, during or after implementation of a heat treatment process, comprising:

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(a) information acquisition and/or selection means allowing a user to indicate and/or select:

(i) a type of heat treatment process implemented or to be implemented,

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(ii) at least one type of technical problem to be solved that has arisen or is likely to arise during implementation of the type of heat treatment process and

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(iii) at least one parameter, preferably several parameters, relating to the configuration of the said heat treatment process.

(b) information processing means for processing at least some of the indications and/or selections made by the user with the aid of the information acquisition and/or selection means;

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(c) information delivery means for displaying, storing, printing, transmitting, interpreting and/or exporting at least one piece of information relating to at least one modification

and/or at least one setting to be made of at least one configuration parameter of the said heat treatment process so as to solve, at least partly, the said technical problem.

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12. System according to Claim 11, characterized in that it comprises a user station comprising:

- 10 - a central processing unit with at least one micro-processor, at least one RAM or ROM memory unit and/or at least one hard disk, which has a storage function, which these elements are coupled to a network card or a modem; and
- a screen allowing information to be displayed; and/or

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 - a data entry keyboard, a mouse, a touchscreen and/or a voice recognition system;

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 and the said user station interacting with at least one central server holding at least one database or databank containing at least some of the knowledge necessary for solving problems likely to arise during implementation of heat treatment processes.

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13. System according to either of Claims 11 and 12, characterized in that the link between the user station and the central server comprises a remote communication network or line, especially the Internet network.

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14. System according to one of Claims 11 to 13, characterized in that it includes data transmission means allowing the choices or selections made by the user by means of the information acquisition and/or selection means to be transmitted to the said central server.

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15. Information processing system intended to facilitate the acquisition of an answer to a question or a solution to a technical problem

associated with a heat treatment operation,
comprising:

- 5 - link activation means allowing an operator to
activate a link to at least one database by means
of at least one processor and to at least one
program contained in at least one memory;
- 10 - at least one link which makes it possible to
activate, via a wire or radio network, at least
one information storage and processing tool,
particularly a hypertext link;
- 15 - at least one information storage and processing
tool containing at least one piece of information
stored in one or more files held in at least one
memory and operating by means of an executable
installed in at least one information system;
- 20 - at least one executable which, by means of at
least one processor, makes it possible to search
for the requested information in at least one
database, to extract it, possibly to store it
momentarily in the random-access memory, and then
to send it back to the operator;
- 25 - means for displaying or receiving information
allowing the operator to receive and/or display
the reply formed from at least one piece of
information.